4.1.1 Classwork

Name_____ Date_____

How can an equation help me predict?
Modeling non-linear data

Today's big goal Collect non-linear data, fit an equation to your data, and use your equation to make predictions.

Group Roles

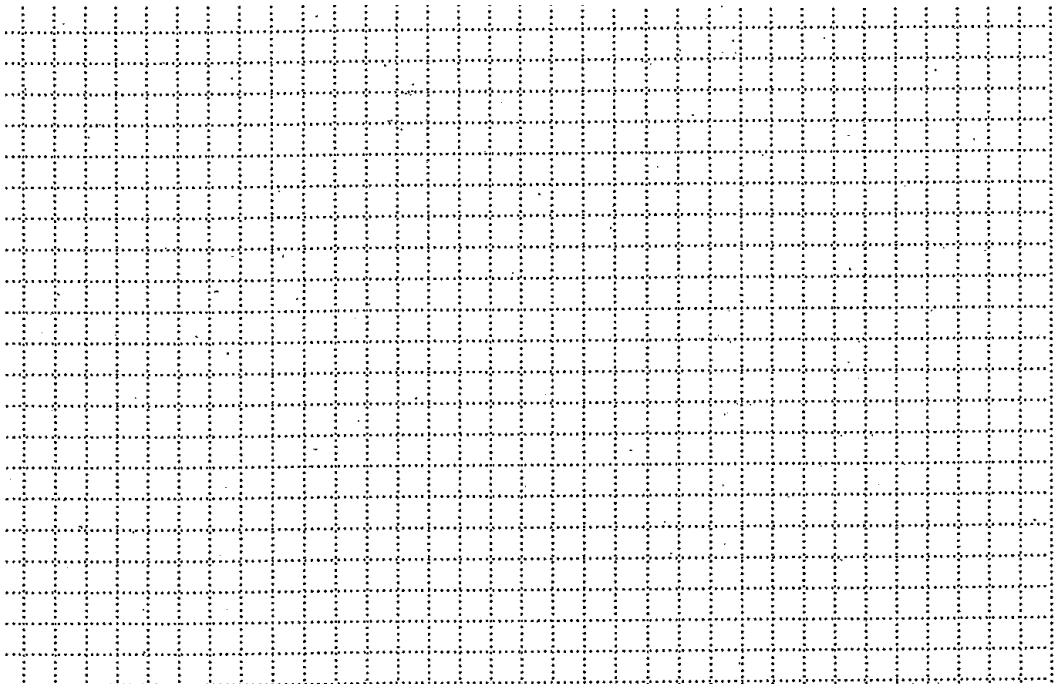
Recorder/Reporter	Facilitator	Task Manager	Resource Manager
Name:	**Name:**	**Name:**	**Name:**
• Records team data in table • Shares team data with all group members	Cuts out circles (starting with the largest one FIRST!)	• Reads all problems aloud to team • Keep the team members focused on the same problem so that they are able to share thinking and ideas. •	Gets & puts away necessary materials: • 1 pair scissors • 4 rulers

4-1 Shrinking Targets Lab!

TABLE:

a. Look at your data with your team and predict what you think the graph will look like. **Justify** your prediction.

b. Using the instructions on the next page (4.1.1B Resource Page), enter your data in the graphing calculator. Plot it on the graph paper below.



c. What kind of equation do you think will model your data?

d. Work with your team to find an equation that fits your data.
   i. Test the accuracy of your team's equation by entering it into your graphing calculator.
   ii. If necessary, adjust your equation to make its graph fit your data better.
   iii. Once you are satisfied with your model, sketch the graph of your equation on the graph from (b).

Our equation: _____

e. What would be the mass of a target with a radius twice as large as the largest one you measured? How do you know?

4-2 **Read all questions aloud:** What more can be said about the equations you used to model your data from the Shrinking Targets Lab? Consider this as you answer the questions below:

a. What are all of the acceptable input and output values (domain and range) for the activity in the Shrinking Targets Lab?

   Do they match the domain and range of the function you used to model your data? If not, why are they different?

b. In part (a),you may have noticed that your equation only makes sense as a model for your data for part of its domain.

   Therefore, to accurately describe your model, you can add a condition to your equation, such as, "This equation is a good model when: _____."

4-3 **Read all questions aloud:** According to the results in the Shrinking Targets Lab, should your scatterplot from 4-1 have any x- or y-intercepts?

If so, what are they and what do they represent?

Does the graph of the equation you found have the same intercept(s)? If not, explain completely why not.